

CLAIMS:

1. Nanoparticles for use in imaging or in radiation treatment of biological material, the nanoparticles comprising a VUV or UV-C emitting material which absorbs high energy radiation and emits VUV or UV-C radiation, said nanoparticles being conjugated to a bio-target specific agent.
- 5 2. Nanoparticles as claimed in claim 1, for use in radiation therapy.
3. Nanoparticles as claimed in claim 1, wherein the high energy radiation is X-rays.
- 10 4. Nanoparticles as claimed in claim 1, wherein said bio-target specific agents are antibodies or antibody fragments.
5. Nanoparticles as claimed in claim 4, wherein the antibodies or antibody
15 fragments have a specificity for a diseased tissue.
6. Nanoparticles as claimed in claim 1, wherein the UV emitting material of the nanoparticles is provided with a covering layer.
- 20 7. Nanoparticles as claimed in claim 6, wherein the covering layer prevents hydrolysis of the UV emitting material.
8. Nanoparticles as claimed in claim 1, wherein the VUV or UV-C emitting material is one or more substances selected from the group: -, $M_2SiO_5:X$, $MAIO_3:X$,
25 $M_3Al_5O_{12}:X$, $MPO_4:X$, $MBO_3:X$, $MB_3O_6:X$ with $M = Y, La, Gd, Lu$, and $X = Pr, Ce, Bi, Nd$ or any of $MM'O_3:X$ with $M = Y, La, Gd, Lu$, $M' = Y, La, Gd, Lu, Bi$ and $X = Pr, Ce, Bi$ or any of $MSO_4:Z$ with $M = Sr, Ca$ and $Z = Nd, Pr, Ce, Pb$ or any of $LuPO_4:Nd$, $YPO_4:Nd$, $LaPO_4:Nd$, $LaPO_4:Pr$, $LuPO_4:Pr$, $YPO_4:Pr$, $YPO_4:Bi$.

9. Nanoparticles as claimed in claim 1, wherein the VUV or UV-C emitting material is a trivalent phosphate.
- 5 10. Nanoparticles as claimed in claim 1, wherein the nanoparticles are doped with an activator.
11. Nanoparticles according to claim 10, wherein the activator has a decay time shorter than 100ns.
- 10 12. Nanoparticles as claimed in claim 10, wherein said activator is Pr^{3+} or Nd^{3+} .
13. The use of nanoparticles as an imaging agent or a radiation treatment
15 agent, the nanoparticles comprising a VUV or UV-C emitting material which absorbs high energy radiation and emits VUV or UV-C radiation.
14. The use of claim 13, in the manufacture of an imaging agent or a
radiation therapy agent.
- 20 15. The use as claimed in claim 13, wherein the high energy radiation is X-rays.
16. The use as claimed in claim 13, said nanoparticles being conjugated to a
25 bio-target specific agent.
17. The use as claimed in claim 16, wherein said bio-target specific agents are antibodies or antibody fragments.
- 30 18. The use as claimed in claim 17, wherein the antibodies or antibody fragments have a specificity for the bio-target.

19. The use as claimed in claim 13, wherein the UV emitting material of the nanoparticles is provided with a covering layer.

20. The use as claimed in claim 19, wherein the covering layer prevents
5 hydrolysis of said UV emitting material.

21. The use as claimed in claim 13, wherein the VUV or UV-C emitting material is one or more substances selected from the group: $M_2SiO_5:X$, $MAIO_3:X$, $M_3Al_5O_{12}:X$, $MPO_4:X$, $MBO_3:X$, $MB_3O_6:X$ with $M = Y, La, Gd, Lu$, and $X = Pr, Ce, Bi, Nd$ or any of $MM'O_3:X$ with $M = Y, La, Gd, Lu, Bi$, $M' = Y, La, Gd, Lu$, and $X = Pr, Ce, Bi$ or any of $MSO_4:Z$ with $M = Sr, Ca$ and $Z = Nd, Pr, Ce, Pb$ or any of $LuPO_4:Nd$, $YPO_4:Nd$, $LaPO_4:Nd$, $LaPO_4:Pr$, $LuPO_4:Pr$, $YPO_4:Pr$, $YPO_4:Bi$.

22. The use as claimed in claim 13, wherein the UV emitting material is a
15 trivalent phosphate.

23. The use as claimed in claim 13, wherein the nanoparticles are doped with an activator.

20 24. The use as claimed in claim 23, wherein said activator is Pr^{3+} or Nd^{3+} .

25. A method of treatment of a human or an animal patient by: providing nanoparticles according to claim 1, administering the nanoparticles to the patient, and irradiating the patient with high energy radiation.